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Classroom Management and Achievement:

A Literature Review

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CLASSROOM MANAGEMENT AND ACHIEVEMENT: A REVIEW OF THE LITERATURE

by

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CLASSROOM MANAGEMENT AND ACHIEVEMENT

Classroom management traditionally has concerned itself with control of pupil behavior, especially deviant behavior, and its criterion has been the reduction or elimination of deviance or problem behavior. Conformity or obedience to teacher instructions and/or to some measure of work involvement or attentiveness sometimes has been used as a measure of effective control but relationships between classroom management and achievement has become an important factor in the search for improved achievement in schools.

The traditional concern with discipline remains but, as Duke (1979) in a comprehensive review, states, "There are indications that the student behavior problems currently causing the greatest concern occur outside the classrooms" (Duke 1979:2). These include, truancy, tardiness, and cutting classes. Behaviour problems may well be related to: in-class management problems, boredom (see for example Jackson 1968), repeated failure and personality conflicts. In other words, failure, in some ways, to adapt successfully to the classroom social system (Duke 1978). If one considers the ability to pay attention and to engage in academic work as being social skills, as do some of the ecologically oriented researchers such as Doyle (1979), and Cartledge and Milburn (1978), this suggests a different approach to classroom management from most of that research which is reviewed in this paper.

Most classroom management research concerns itself with what goes on in the classroom and here, the distinction between classroom or behavior management and other concepts, such as emotional climate and instructional management, is collapsing. Several researchers (eg. Duke 1979; Emmer, Evertson & Anderson 1979a) feel that classroom management and instructional management are closely related, at least, in practice. Effective classroom managers usually are effective instructional managers and vice-versa. While some researchers, like Soar and Soar (1979), maintain that emotional climate, classroom management and instructional management can be separated, they also admit that,

> Our results suggest that the typical teacher does not distinguish the management of behavior from the management of learning tasks or the management of thinking (p. 109).

The four most quoted and commonly used variables of Kounin's classroom management variables which emerged from his now well-known series of discipline studies, refer to management both of behavior and of instruction (Kounin 1970). "Withitness" and "overlapping" for example, refer to the management of pupil behavior, whereas "smoothness" and "momentum" are qualities of instructional management. Kounin's research represents the first of the three lines of research which are present in most current studies of classroom management and which use achievement or a proxy variable as a criterion measure. These studies provided researchers with relationships of some contextual variables such as time and attention to the mainstream of process-product research on effective teaching.

The convergence of results from several major process-product studies, especially in elementary mathematics and language arts classes, led to the formulation of the model of "direct instruction" articulated in particular by Rosenshine (1978, 1979), which emphasizes managerial skills on the part of the teacher and which links management of behavior and of instruction in an efficiency model of effective teaching. Very simply, the model of "direct instruction" appears thus:

classroom management	pupil engaged	
	time	achievement
instructional management	(time on task)	

To this the environmental or ecological theorists would add teacher characteristics and processes (e.g. planning, beliefs, expectations) as important antecedents of managerial style, and student characteristics (e.g. socio-economic-status, ability, cognitive style, perceptions of teacher, subject, social skills) as important antecedants of attending or of academic engagement (eg. Borko et al 1979, Winnie & Marx 1979, Clark & Yinger, 1979, and Doyle 1979b). Thus we might have:

TEACHER CHARACTERISTICS	TEACHER BEHAVIOR	STUDENT CHARACTERISTICS	STUDENT BEHAVIOR	LEARNINGS
beliefs, planning, expectations, decision making, etc.	classroom management, instructional management.	S.E.S. ability cognitive style perceptions, social skills, etc.	attentiveness, task engagement etc.	achievement affective outcomes etc.

Research has almost always focussed upon a part or one set of linkages in this sequence and so, in reviewing the total body of studies, it is easier to group studies of parts of the system under their common elements. For example, those researchers following the tradition of process-product studies, have tended to probe the relationship of managerial skills to achievement,(but) omitting most teacher and student effects, in their continuing search for generic variables of effective teaching. Workers of the environmental/ecological tradition, on the other hand, have less belief or interest in the generality of teaching effects and have tended to focus upon the interactions of teacher and student effects and teacher and student behaviors, as well as the effects of these upon such concepts as classroom climate, in their efforts to describe and understand the classroom as a social system. A third group of researchers, interested in contextual or institutional research, has looked at all aspects of time in its relation to learning; from simple compilations of allocated time to inferential measures of the time students are actively engaged in academic work of a relevant nature and suitable level of difficulty.

Organization of the Literature Review

Since time, or some associated measure, is increasingly becoming the variable used as an indicator of, or as a proxy for, achievement, or, indeed, as tantamount to achievement (learning), the research upon which this relationship is postulated is briefly summarized. Ecological studies cover a wide range of approaches; from very "fine grained" analyses of decision-making-using techniques, such as stimulated recall, to ethnographic descriptions by participant-observers of the classroom as a complete social system. Whilst a comprehensive review of all of these studies is impracticable, major findings and methodological questions are included. Major studies relating managerial skills to achievement (or a proxy measure), are reviewed beginning with a discussion of the relationship between classroom management and instructional management.

Whilst the major thrust of present research is intended to delineate the manner in which classroom management contributes to greater efficiency in learning, it is desirable to begin with a review of the research related to the more traditional disciplinary approach to classroom management. It is from this traditional approach that Kounin's important work is derived.

The Traditional Disciplinary Approach to Classroom Management and the Work of Jacob Kounin

Kounin is best known for his studies of these managerial skills which he referred to as "withitness," "overlapping," "smoothness," and "momentum" along with their relationship to work involvement and to deviancy (Kounin 1970). These concepts represented the culmination of some fifteen years of research, which first began with studies of discipline problems (deviancy) on the target student (deviant) and the other pupils in the class. Kounin and his co-workers observed, described and finally experimented with events such as "desist events" (teachers' attempts to deal with deviancy) and the effects of such desist events upon others in the class as well as the target student. One such effect was described as the "ripple effect" (the effect of a desist event upon other students). Conflicting results from observations and experimental studies convinced Kounin that experimental manipulations were not suitable for classroom management studies, dealing with discipline. The experimental situation, Kounin concluded, simply is not related to any natural one and he had been concentrating on the wrong events and measuring the wrong variables. Variables, such as clarity, firmness, child treatment and focus, were found to be unrelated to success of desist events, pupil work involvement, or to deviancy.

In their "second generation" of observational (correlational) studies, Kounin and his associates, took "work involvement" and "freedom from deviancy" as dependent variables, arguing reasonably that these were clear indicators of managerial success, and tried to find (teacher) managerial skills that correlated highly with them. The four skills, or rather, clusters of skills, (each represents a cummulative or overall measure of a number of observations of classroom events) denoting "withitness", "overlapping", "smoothness" and "momentum", are those that had the highest and most consistent correlations with the two dependent variables, work-involvement and freedom-from-deviancy. All of these studies were carried out in elementary grades, but as Dunkin and Biddle (1974:161) note, it is likely that results from similar studies at the secondary level would be somewhat or even considerably modified. Two settings were studied: recitation and seatwork. Combining the four skills with the two dependent variables, resulted in four sets of findings. These findings are summarized as follows (with correlation coefficients recorded parenthetically):

RECITATION

Work Involvement	
Withitness	(.615)
Momentum	(.656)
Smoothness	(.601)
Overlapping	(.460)

Freedom from Deviancy	
Withitness	(.531)
Momentum	(.641)
Smoothness	(.489)
Overlapping	(.362)

SEATWORK

Work Involvement		
Withitness	(.307)	
Momentum	(N.S.)	(.198)
Smoothness	(.382)	
Overlapping	(N.S.)	(.259)

Freedom from Deviancy	
Withitness	(.509)
Momentum	(.490)
Smoothness	(.421)
Overlapping	(.379)

(r of .275 sig p .05)

Differences between recitation and seatwork were apparent, with all correlations for the latter being much lower. For seatwork, two of the variables, momentum and overlapping, failed to correlate significantly with work-involvement, although they did for freedom-from-deviancy.

Since these variables are not operationalized independently but are measured as cumulative scores of some of the same events, Kounin suspected that they might intercorrelate. Indeed they did. For example, "withitness" and "overlapping" were highly correlated (r .598). However, when these effects were partialled out, "withitness" remained significantly correlated with "work-involvement" in recitation settings (.477), and in seatwork settings (.380) and also remained significantly correlated with freedom-from-deviancy in recitation settings (.422) and in seat-work settings (.380). "Overlapping" on the other hand was reduced to insignificance in all four settings. Two obvious inferences are that firstly, "withitness" is a more powerful correlate of work-involvement and freedom-from-deviance than is "overlapping". A second is that since the two are significantly intercorrelated, a teacher who is "withit" (that is who "has eyes in the back of his/her head" as Kounin describes it (1970:80)), who knows what is going on in the classroom and communicates that knowledge to his/her pupils is likely to be someone who can deal successfully with more than one thing at a time, which is an example of overlapping. Indeed the latter may be a necessary ingredient of "withitness". Similarly "momentum" and "smoothness", which refer to movement management, correlate significantly with each other (.745). Teachers, whose behavior produces jerky movement (lack of smoothness), produce a slow down in movement (lack of momentum). "Momentum" remains the most powerful variable after partial correlation; remaining significantly, though less so, correlated with work-involvement and free-from-deviancy in recitation settings, but not significantly correlated with them in seatwork settings. When "momentum" is partialled out of the correlations of "smoothness" with the four combinations, all fall below significance.

Thus, of the four group management variables, "withitness" shows the highest correlation with "momentum" being a strong predictor in recitation settings. A number of aspects of Kounin's work held great interest for researchers in other areas. Although he had not used any measure of achievement as a dependent or outcome variable, Kounin's use of work-involvement as a dependent variable suggested other such variables as attention, time-on-task and engaged time, which were in extensive use and which had shown quite a consistent relationship with achievement.

Attention and Time

Attention has a long and chequered history in educational research. As Smyth (1979), in his excellent review notes, attention has been seriously studied for some seventy years, yet the results of that study are far from satisfying or conclusive. Mechanical measures of pupil attention, measured by such indicators as eye contact or involvement in tasks, have shown a wide range of (positive) correlations with achievement.

While these mechanical measures of attention clearly bear a problematic relation to "real" attention or learning, techniques for readily determining when a pupil truly is attentive to his school work have proven illusive. In the most successful and thorough of recent studies of attention, moderate correlations (of about .4) with achievement have been obtained (see Bloom 1976; Smyth 1979; Berliner 1979; and Lomax and Cooley 1979). A statement made by a schoolman nearly a century ago (Currie 1884), and quoted by Smyth still well summarizes our knowledge of the importance of attention:

> The art of teaching ... comprehends all of the means by which the teacher sustains the attention of his class. By attention, we do not mean the mere absence of noise and trifling; or that inert passive state in which the class, with eyes fixed on the teacher, it may be, gives no symptom of mental life; not that intermittent and almost strikes their fancy; not the partial attention given by a few who may be in the immediate neighborhood of the pupil addressed. The only satisfactory attention is that which is given voluntarily and steadily by all during the entire instruction (p. 7).

More successful have been studies of time, especially of the time students spend actively engaged in academic work. However, a recent review (Lomax & Cooley 1979) finds that "the relationship between instructional time and student achievement has not been as strongly and consistently substantiated in the literature as most educational researchers have believed" (p. 15). The time allocated to instruction has been measured at a number of levels, from that required by state or local curricula for graduation, for example (eg. Hester and Ligon 1978), to the time allocated by particular teachers to particular subjects in their own classrooms. (See Smyth 1979; Berliner 1979). More striking than the rather moderate-low correlations generally found between allocated time and achievement in these studies, is the great variation in time allocated to various subject areas and to various topics within subject areas by individual teachers. Equally striking is the finding that at the curriculum level, less than 50% of available time is allocated to academic subjects in all units studied (Berliner 1979).

Since allocated time is a rather "crude" measure and predictor of achievement, attempts to operationalize a more refined definition of the time spent in learning resulted in the use of such measures as "engaged time," "time-on-task" and "academic-learning-time". These latter measures attempt to record the actual time a particular pupil spends in some observable task related to the content under study. Correlations between these measures and achievement have been consistently higher than those for allocated time or indeed any other classroom variable. Prior achievement still remains the highest correlate, but this is a presage variable, although as we shall see, it does bear a circular relation to task engagement and attention. So impressed were some researchers by the consistently high correlation that Berliner, for example, suggests that his measure of "Academic Learning Time" may be tantamount to a measure of achievement (1979:134). Few others would go this far, but clearly these measures of time spent in learning are widely accepted as proxy variables for achievement.

Time and Direct Instruction

"Attention" or "engagement" or "time-on-task", a proxy measure for achievement that stresses efficient use of learning time, suggest to many the marriage of classroom management skills and instructional management skills. If increasing achievement means increasing time students spend actively engaged in learning, the link between the management of behavior and the management of instruction is forged. The management of learning time encompasses all other aspects of the classroom system. Support for focussing attention upon an "engaged time" type of dependent variable has come from a number of different research traditions. Recent process-product research has provided convincing support for a model of "direct instruction" in the elementary grades (eg. Brophy & Evertson 1976; Medley 1979; Rosenshine 1979; and Fedigan 1979) which contains several elements of classroom management and which is designed to increase the amount of on-task behavior.

Rosenshine (1976) describes the model as follows:

> Time is structured by the teacher, and a large portion of time is spent on a number of reading activities. There is a predominance of seatwork in academic workbooks. Materials are broken into small steps. Sufficient time is allotted for completion of these tasks.
>
> Questions are narrow, direct, usually with a single answer, and structured to obtain a high percentage of correct answers.
>
> Teachers or materials provide immediate feedback using praise and acknowledgement of student answers. There is little discussion or probing of the answers -- correct answers are followed by another question and incorrect answers are followed by the teacher giving the answer.

> Student work in small or large groups supervised by the teacher for instruction or for seatwork. There is little free time or independent unsupervised activity.
>
> There is less off-task student behavior. This may occur because of the systematic, structured, supervised setting and the management system.
>
> In addition to the above, the following may be reasonable extrapolations, although they appear in only one or two studies:
>
> The teacher is the dominant leader who decides which activities will take place. The learning is approached in a direct businesslike manner and is organized around questions posed by the teacher or the materials. The materials and the instruction is systematically organized proceeding within small steps. Goals are clear and known to the students. Yet, within this task setting the teacher is warm and convivial, frequently giving praise and encouragement to the students for academic work (p. 12-13).

Environmental or Ecological Studies

Workers from the environmental tradition, while accepting the usefulness of engaged time or attention as an indicator of achievement, are less convinced of the generalizability of teachers' attention-raising behaviors. Already Brophy and Evertson (1976) had shown that behaviors that promote on-task behavior in low socio-economic-status (S.E.S.) children did not do so for high S.E.S. children, and they and McDonald (1976) had found grade level and subject matter differences. Similar findings come from the work of Walberg and his associates in their construction of learning environments and "cognitive maps" from the perceptions of students (Walberg 1971, 1974; Haertel & Walberg 1979).

Recently classroom ecology writers such as Doyle (1979) have suggested that the classroom environment is created as much by pupils as it is by teachers, so that classroom management and instructional management are the result of an interactive process, a sort of bargaining between teacher and pupils in which both parties are influential. For example, Cartledge and Milburn (1978) describe attention as a "survival" skill for students which is crucial to their successful adaptation to the classroom social system and which can be learned as a separate skill.

So, whilst few would argue that engaged time or attention or some such measure is not a good indicator of achievement, the generality of the link between classroom management and/or classroom instruction is far from established. For Doyle, the teacher's task becomes one of primarily optimizing cooperation in the classroom. Then as Doyle states forcefully:

> To say that the teacher's task is to maximize learning outcomes for individual students is to define the norm of rationality for classrooms. At the same time, this definition, by focussing on outcomes, presumes that alternative courses of action can be implemented with equivalent ease. Such a view trivializes problems posed by the environment in which teachers work. The emphasis on cooperation, on the other hand, directs attention to the operations of teaching and to questions of implementation. Such questions are fundamental (p. 48).

Since all classrooms have a rule structure of some kind, students who do misbehave (break the rules) can be said to be engaged in a behavior task, "a student initiated action involving a goal and a set of operations to achieve that goal" (p. 50). The goal may be to relieve boredom, embarrass the teacher or so on, but to achieve that goal, the student must be able to "circumvent" the teacher's enforcement system. Some students are very good at this and,

> In such cases, the magnitude of the disruption rather than the duration of the violation often defines the degree of success. If the move is skillful and the disruption large, getting caught is not always relevant (Doyle 1979:51).

An illustration of the ways in which cooperation is influenced or affected is the study by Copeland (1979) of the ways in which teachers, in this case student teachers, and their students adjusted or "negotiated" a classroom structure. Copeland concluded from this observational study that, "the findings would seem to support the contention that influence in classrooms is bi-directional in nature" (p. 27) and more specifically that, "pupil control techniques used by the teacher appear here to have been more a result than a cause of pupil achievement" (p. 27).

Clearly this way of thinking about, and of researching classroom behavior of all kinds is quite different from that which assumes that teachers act upon students in a largely unidirectional manner. It is not a "new" way of thinking about classrooms; for example, James Herndon's book The Way Its Spozed To Be (1965) could be viewed as a case study of students' expectations of the way schools should run (the way it's spozed to be!),and the way teachers should behave and which interact (sometimes strongly) with attempts by a teacher to alter that expected structure of the classroom. Other works by "radical" writers of the sixties, such as Kohl (1967) could be interpreted similarly.

While the ecological view of the classroom offers many insights and does argue compellingly against any over-simplification of what surely is a complex social system, it also raises severe methodological problems for the researcher. Difficulty in measuring the appropriate variables, validity of measurement and especially the inability to generalize from any results, make these research designs unattractive to many researchers and funding agencies. Ethnographic descriptions of classrooms have not yet yielded description or predictive categories very different from those of the average classroom "ethogram". And, although Walberg and his associates have established the validity and reliability of students as reporters of classroom events, structure, and climate, the kinds of findings so far published from these studies present a sort of "mirror image" quite congruent with the results of any process-product studies (eg. see Fedigan 1979).

In an attempt partly to tease apart the heavily entwined variables, or sets of variables, that interact to make up the ecology of the classroom, Soar and Soar (1979), in a series of four related studies, distinguished conceptually between emotional climate (a concept closely related to Walberg's concepts and measured, in part, by his Learning Environment Inventory) and three management areas: management of behavior, management of learning tasks and management of thinking.

Their studies did support the separation of emotional climate from management and whilst, as we have seen, they feel that behavior management can be separated from instructional management (see quotation p. 3), the two areas of instructional management were not independent.

Soar and Soar's findings for emotional climate are of interest to the proponents of "direct instruction," who are at pains to state that such teaching does not have to be grim, joyless and distasteful to students (eg. Medley 1979; Rosenshine 1979). The Soars found no relationship between positive emotional climate, or even neutral emotional climate and achievement. They did find that negative affect was negatively correlated with achievement and conclude that it should be avoided. These results suggest a parallel with the process-product studies that find no correlation between positive reinforcement, praise or encouragement, and achievement, or even that criticism in some circumstances (eg. high S.E.S.) can be a positive correlate of learning (eg. Brophy & Evertson 1976; Rosenshine 1978).

For the management of behavior, the Soars summarized their findings thus:

> the synthesis suggests that teacher should limit pupil freedom to move about, to form subgroups, and to socialize, and that, unless a teacher has established a minimum of structure, relatively strong interactions that are not functional for pupil learning are likely to occur (p. 117).

Their findings for instructional management were more complex since they found that many teachers did not distinguish between the concepts and that "the teachers who controlled behavior closely also controlled the learning tasks closely. That is, the teacher defined the tasks narrowly and limited pupils' freedom to explore ideas. Conversely, the teacher who gave pupils freedom to explore ideas and a degree of choice in a task typically also gave them considerable freedom of behavior" (p. 110). However, they also found a curvilinear relationship between some behaviors and learning, especially between the degree of freedom allowed pupils and the level of thought processes required of them. Thus we have the suggestion that the managerial style (behavior and instruction) of a teacher is consistent and perhaps a function of some other teacher characteristics, such as the "traditionalism" found by Brophy and Evertson (1976), and, as a caveat to the supporters of "direct instruction" that more, of any kind of behavior, may not always be better.

Process-Product Studies and Classroom Management

It is in process-product research that the integration of classroom management and instructional management has been most complete. This line of research, long preoccupied with effective teaching, currently is characterized by research designs incorporating measures of managerial efficiency as correlates of effectiveness.

The much quoted Texas Teacher Effectiveness Studies (Brophy & Evertson 1976: Brophy 1978), indicated that teachers in their sample who were successful at producing consistently high achievement, were using teacher-centered, directive, managerial and instructional behaviors that limited student freedom but maintained higher levels of on-task behavior. As a follow-up, The University of Texas Research and Development Center carried out an experimental study to see if teachers could be taught these apparently effective managerial skills. To do so, they drew up a list of "desireable" teacher behaviors from their research results and gave teachers in the experimental groups instructional packages explaining the utility and the application of effective strategies. The goal was to observe whether teachers would learn and apply the strategies and whether, as a result, there would be increased achievement in their classrooms. The desired behaviors or principles, as the Texas workers called them, related only to teacher management (behavior and instructional management), in small group settings, in first grade reading classes. The following 22 principles were defined for use in the study.

I. ORGANIZATION AND MANAGEMENT

GETTING THE CHILDREN'S ATTENTION

1. The teacher gets everyone's attention before starting the lesson.
2. The children sit with their backs to the rest of the class while the teacher faces the class.

INTRODUCING THE LESSON

3. The teacher introduces the lesson with a brief overview.
4. The teacher presents new words clearly.
5. After presenting new words, the teacher has the children repeat them.
6. A demonstration or explanation precedes the children's attempts to do the work.

CALLING ON CHILDREN

7. The teacher should work with one child at a time, so that everyone is checked and receives feedback.

8. The teacher should call on children in order rather than randomly.

9. Occasionally the teacher should question a child about another child's responses (to keep everyone alert).

10. The teacher should minimize calling on volunteers.

11. The teacher should discourage call outs and should emphasize that each child is responsible for the question asked of him.

12. The teacher should avoid rhetorical questions, answering her own questions, or repeating questions. These confuse the children.

MEETING INDIVIDUAL LEARNING NEEDS WITHIN THE GROUP

13. At some point, the teacher must decide if the whole group can meet the lesson's objectives. If she decides they can, she should hold the group together, making sure that everyone masters each step before moving on to the next step.

14. If the teacher decides that everyone cannot meet the objective, the students who can do so should be taught through to the end and then dismissed, so that the teacher can spend more time with the other children.

15. An exception to the above occurs when the teacher wants to use a student who has mastered the objective as a model for the others. Here, she may retain one or more such students in the group in order to carry on a dialogue.

16. If some of the children do not succeed in meeting the objectives before lesson time is up, arrangements should be made for extra tutorial help.

II. RESPONDING TO CHILDREN'S ANSWERS

The teacher's feedback to children's answers depends on: (1) the type of question (whether it requires memory or reasoning), (2) the pace of questioning (whether rapid for drill or slower for more thoughtful questions), and (3) the child's answer (correct, incorrect, "I don't know," or no response).

WHEN THE CHILD DOES NOT RESPOND

17. After asking a question, the teacher waits for the child to respond and also sees that other children wait and do not call out answers. During the more slowly paced parts of the lesson, the teacher should wait for an answer as long as she feels that the child is thinking and will answer, but not so long as to embarrass the child or lose the other children's attention.

    If the child does not respond within a reasonable time, the teacher should indicate that some response is expected by probing ("Do you know?"). She should then simplify (see #19) according to the type of question.

WHEN THE CHILD'S ANSWER IS INCORRECT

18. The teacher should indicate that the answer is wrong, and then follow simplification procedures oulined below for the two types of questions.

SIMPLIFICATION PROCEDURES

19. The appropriate simplification procedure is determined by the type of question.

    a. If the question deals with factual knowledge that cannot be reasoned out, the teacher should give the answer to the child and then move on.

    b. If the question is one that the child could reason out with help, the teacher should provide clues or simplify the question. If the clues still do not help the child, he should be give the answer. The teacher should never ask another child to supply the answer.

WHEN THE CHILD IS CORRECT

20. The teacher should acknowledge the correctness and make sure that everyone else heard and understood the answer.

PRAISE AND CRITICISM

21. Praise is important but should not be used indiscriminately. Praise thinking and effort more than just getting the answer, and make praise as specific and individual as possible.

22. Criticism should also be as specific as possible and should include specification of desirable or correct alternatives. (Anderson & Brophy 1976:3-6).

The experiment was carefully designed. Schools were matched for S.E.S. and matched groups were randomly assigned to three different groups: (1) one in which teachers were instructed in the principles and their application of them observed (treatment-observed group), (2) one in which teachers received the instructions but were not observed (treatment-unobserved group) and, (3) one control group in which teachers did not get any instruction in the managerial principles, but who were observed (control-observed). The study lasted for a year with observations made once a week and achievement residuals were calculated for all classes. Since it was assumed by the researchers that some or even all of the 22 principles would already be in use by some or all of the teachers, the recorded levels of these behaviors in the control group were taken as "base levels" for the behaviors against which the treatment was measured.

The results, in general, supported use of the model in that some of the principles were applied significantly more in the experimental classes and, hence, achievement in these classes was significantly higher than achievement in the control classes. The two experimental groups did not differ significantly on any of the achievement measures but the treatment groups scored significantly higher on all tests (M.A.T.), except word analysis, (Anderson & Brophy 1976), than did the control group. However, not all the principles showed increases in the frequency of their use: The results of this part of the study are summarized below (from Brophy & Evertson 1978).

PRINCIPLE	LEVEL OF IMPLEMENTATION
Getting and maintain attention (1 & 2)	n.s. difference in implemetation

Introduction of lesson/ new material (3, 4, 5 & 6)	n.s. difference in implementation
Calling on individual students in group (7, 8, 9, 10, 11 & 12)	well implemented by experimental group
Individualization (learning rates) (13, 14, 15 & 16)	Poorest implementation
Feedback to incorrect answers (17, 18 & 19)	best implementation
Feedback to correct answers (20)	not implemented
Praise and criticism (21 & 22)	implemented to some extent

(from, Anderson, Evertson & Brophy, 1978)

Anderson, Evertson and Brophy (1978), found that "the principles that showed the strongest treatment effect on teacher behaviors dealt with discrete, easily described behaviors that were probably already in the teacher's general repertoires of techniques," (p. 27) and they concluded that "future treatment models should consider the specificity and familiarity of the behaviors, their appropriateness for particular contexts, and the role of teacher judgement in implementing them" (p. 27). Clearly many of the principles in the Texas study are closely related to the management variables described by Kounin (1970). As Brophy and Putnam (1979) have said of them:

> In a correlational study at the second and 3rd grade level and in an experimental study of instructional in 1st grade reading groups, indicators of "withitness," "overlapping" and "smoothness" of lesson pacing and transitions all were associated not only with better group management, but also with better student learning (p. 199).

The experimental approach was taken a step further at Stanford University by Crawford et al (1978), who carried out a study similar to the Texas one, but with additional controls of some teacher and pupil characteristics and with the use of two forms of inservice training (treatments). They visualized their design thus:

ANTECEDENT CONDITIONS	INTERVENTION		OUTCOMES		
teacher cognitions and attitudes student characteristics environmental factors	teaching/ learning interactive processes occurring between September and May	→	student's behavior while in class	→	measurable student outcomes e.g. achievement

Figure 1. Generalized sequence-of-effects model of teaching and learning in schools.

(Crawford & Stallings 1978:11)

The teacher characteristics measured were verbal ability and degree of structure while the pupil characteristic was prior achievement. The latter alone correlated 0.9 with post achievement, leaving little room for a measurable treatment effect. However, there is a circularity about such relations that requires them to be "ignored". Present "prior achievement" is the result of past "prior achievement" and only those who maintain that non-school influences are the cause of all "prior achievement" would deny that school learning (and teaching) is a part of all measures of "prior achievement".

The teacher behaviors that were taught in the in-service packages were similar to those in the Texas study and again classroom management skills were an important component. The Texas study had used only written instructions as the training device with their teachers, so to test whether more elaborate training, including workshops and demonstrations, would result in higher rates of implementation, the Stanford team added these components to comprise a maximal inservice treatment group. A minimal treatment group received only written instructions in their inservice training program. The variables used in the Stanford study are the following:

BEHAVIOR MANAGEMENT AND CLASSROOM DISCIPLINE

1. Teachers should have a system of rules that allows pupils to attend to their personal and procedural needs without having to check with their teacher.

2. Teachers should prevent misbehaviors from continuing long enough to increase in severity or spread to and affect other children.

3. Teachers should attempt to direct disciplinary action accurately--that is, at the child who is the primary cause of a disruption.

4. Teachers should keep 'overreactions' to a minimum (even though overreactions are probably effective in stopping the misbehavior).

5. Teachers (and aides, if present) should move around the room a lot, monitor pupils' seatwork, and communicate to the pupils an awareness of their behavior, while also attending to their academic needs.

INSTRUCTIONAL METHODS

6. When pupils work independently, teachers should insure that the assignments are interesting and worthwhile and still easy enough to be completed by each third-grader working without teacher direction.

7. Teachers should keep to a minimum such activities as giving directions and organizing the class for instruction. They can do this by writing the daily schedule on the board, insuring that pupils know where to go and what to do, etc.

8. Teachers should spend at least one-third to one-half of their time teaching larger groups of pupils (more than eight children). When

they do teach smaller groups or individuals, they should take steps to make sure that the other pupils in the class have work to which they can attend.

9. Teachers should make abundant use of textbooks, workbooks, and other pencil-and-paper activities. These have been found to be associated with higher pupil achievement. But the use of games, toys, and machines has not been found to be associated with higher pupil achievement.

10. Teachers should frequently conduct public (i.e., addressed to a larger group or the whole class) question-and-answer sessions concerned with the academic subject matter at hand. With less academically oriented pupils, teachers may find it helpful to initiate some brief private discussions concerning personal matters.

11. Teachers should provide visual demonstrations and phonics exercises in conjunction with reading activities.

SPECIFIC METHODS FOR ASKING QUESTIONS AND PROVIDING ANSWERS

12. In selecting pupils to respond to questions, teachers should use the technique of calling on a child by name before asking the question, as a means of insuring that all pupils are given an equal number of opportunities to answer questions.

13. Teachers should avoid calling on volunteers more than 10 or 15 percent of the time during question-and-answer sessions. It is also advisable to discourage pupil "call outs" to questions asked of other children (except possibly from less academically oriented children who may benefit from this type of activity).

14. In the interest of promoting smooth, task-oriented discussions, teachers should not encourage large numbers of pupil-initiated questions and comments. It is also important for teachers to listen carefully to pupils' opinions and, if a disagreement is called for, to express such disagreement to the child.

15. With less academically oriented pupils, teachers should ask easier questions -- questions that can almost always be answered correctly. When questioning more academically oriented pupils, teachers should ask more difficult questions -- questions that are answered incorrectly about one fourth of the time.

16. Teachers should give praise only for really outstanding work; also, praise is likely to be more effective in communicating higher expectations ("you can be better") to more academically oriented pupils.

17. With less academically oriented pupils, teachers should always aim at getting the child to give some kind of response to a question. Rephrasing, giving clues, or asking a new question can be useful techniques for bringing forth some answer from a previously silent pupil

or one who says "I don't know" or answers incorrectly.

18. With more academically oriented pupils who generally become actively involved in discussions, teachers should concentrate on getting the correct response. Therefore they should redirect questions to other pupils if the more academically oriented pupil answers incorrectly.

19. Teachers should give the answer (to both more and less academically oriented pupils) if the response is at least partly correct. Teachers should not simply repeat the same question if any pupil (either more or less academically oriented) answers incorrectly, says "I don't know", or remains silent.

20. With more academically oriented pupils, teachers should give brief feedback extensively (80% or more of the time) during private, one-to-one discussions. When dealing with less academically oriented pupils, teachers should use approximately equal amounts of brief and longer feedback, tailoring the duration of their reactions to the needs of the individual child in each situation.

21. During reading-group interaction, teachers should give a maximal amount of brief feedback, and provide fast-paced activities of the "drill" type.

22. During public question-and-answer sessions, teachers should occasionally give a detailed, "why" explanation in answer to a question.

(Crawford and Stallings 1978: 2-6)

The results of the Stanford study may be summarized as follows:

1. Significantly higher or definite trends to higher scores were found for the treatment groups on the various reading measures.

2. The minimal treatment group (the teachers who received only written instructions) scored highest and had highest implementation rates.

3. Verbal ability of teachers and to a lesser extent their degree of structuredness, were significant predictors of implementation.

4. The teachers in the minimal treatment group scored significantly higher on verbal ability than did the teachers in the maximal treatment group. The additional variables may have confounded the treatment effect in the latter group.

Thus, there was a measurable treatment effect on pupil achievement, but the treatment effect upon teachers may well have been modified by teacher verbal ability. Crawford and Stallings summarize their findings saying that "some components of the training program were more effectively implemented than others and were more highly related to achievement gains" (p. 27). Behavior management variables were almost always implemented, leading the Stanford researchers to conclude that "(these variables) suggest that 'efficient time-use' may be the underlying requisite for achievement-facilitative teaching. Effective teachers proactively avoided behavior problems and interruptions so that student 'time-on-task' could be increased" (p. 27).

Thus, both the Texas and Stanford studies found support for an efficiency model of teacher-centered teaching on the lines of that proposed by Rosenshine, in which classroom management and instructional management are integrated into a system for maximizing the time pupils spend on well-defined learning tasks.

Carrying on the same line of research yet another step further, a study by the Centre for Research in Teaching called project QUEST (University of Alberta), involved teachers in the formulation of the teaching skills making up the experimental treatment. Both the Texas and Stanford teams had noted their belief that the implementation of the model depended in good part on its acceptance by teachers, as well as upon its congruence with their experience and beliefs about its appropriateness. Thus, while the list of behaviors in Project QUEST is largely based upon the same research findings as those of the Texas and Stanford studies, some behaviors that the teachers strongly disagreed with (eg. patterned turns), were omitted, whilst others, that they strongly advocated (eg. spot-checking assignments), were added. The 28 variables used in Project QUEST were as follows:

1. Teachers should use a system of rules dealing with personal and procedural matters.
2. Teachers should prevent misbehaviors from continuing.
3. Teachers should direct disciplinary action accurately.
4. Teachers should move around the room a lot (monitoring seatwork).
5. Teachers should handle disruptive situations in a low key manner (non-verbal, proximity, eye contact).
6. Teachers should insure assignments are interesting and worthwhile when children work independently.
7. Teachers should use a system of rules which allows pupils to carry out learning tasks with a minimum of direction.
8. Teachers should optimize academic learning time. Pupils should be actively involved and productively engaged in learning tasks.

9. Teachers should use a standard signal to get students' attention.

10. Teachers should not begin speaking to the group until all students are paying attention.

11. Teachers should use a variety of instructional techniques adapting instructions to meet learning needs.

12. Teachers should use a system of spot-checking assignments.

13. Teachers should relate mathematics games and independent activities to the concepts being taught.

14. Teachers should use techniques that provide for the gradual transition from concrete to more abstract activities.

15. Teachers should use an appropriate mixture of high and low order questions.

16. Teachers should be aware of what is going on in the classroom.

17. Teachers should be able to attend to more than one issue at a time.

18. Teachers should facilitate the smooth flow of the lesson or a smooth transition from one activity to another.

19. Teachers' behavior should maintain the pace of the lesson.

20. Teachers should be clear in presentations to the class.

21. Teachers should be able to motivate children.

22. Teachers should provide evidence of 'caring', 'accepting', and 'valuing' of the children.

23. Teachers should respond accurately to both obvious and less obvious meanings, feelings, and experiences of the children.

24. Teachers should select many different pupils to respond to questions.

25. Teachers should use techniques such as rephrasing, giving clues or asking a new question to help give an improved response when pupil's answers are incorrect or only partially correct.

26. Teachers should use praise to reward outstanding work as well as to encourage pupils who are not able to do outstanding work.

27. Teachers should use mild criticism on occasion to communicate expectations to more able pupils.

28. Teachers should accept and integrate pupil initiated interaction such as questions, comments or other contributions.

(MacKay 1979:42-44)

As in the Stanford Study, two forms of inservice treatment were provided. The total treatment consisted of four parts:

1. large group presentation of the strategies
2. textual materials listing and explaining the strategies
3. small group discussions
4. multimedia presentations with training films, videotapes and role playing.

One experimental group received all components of the inservice treatment in four half-days of training, whilst a second group spent two half-days in training, using only the first three components.

Perhaps, as a result of the high level of teacher involvement, Project QUEST obtained the highest levels of implementation of the treatment strategies. Only four (#4, 13, 25 and 27) of the twenty-eight strategies showed less than a significant increase with the treatment.

Both arithmetic and language classes were observed at grades 3 and 6 and achievement measures in both subjects were used as criterion measures. However, it was found that the standardized tests used for reading in grades 3 and 6 showed distributions with such little variance that no treatment effect could be expected. (In spite of this, seven out of twenty-eight significant correlations were obtained for grade 6 reading). Thus, the only useful criteron measures were the arithmetic ones, which showed 16 out of 28 significant (0.05) correlations with treatment strategies at the grade 3 level but only 2 at the grade 6 level. Given the poor discrimination of the criterion measures chosen, the results of Project QUEST, which was intended to be a pilot project only, are impressive. If all four criterion measures are used, 21 out of 28 of the teacher strategies showed at least one significant correlation with achievement. MacKay summarizes the results in the following way:

STRATEGIES WITH AT LEAST ONE SIGNIFICANT (POSITIVE) CORRELATION WITH ACHIEVEMENT	STRATEGIES SHOWING NO SIGNIFICANT CORRELATIONS WITH ACHIEVEMENT
#2, 3, 5, 6, 8, 10, 12, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28	#1, 4, 9, 11, 13, 14

(from MacKay 1979:35-36)

When a meta-analysis of the type described by Glass (1979) and Gage(1979) is applied, another three strategies (1, 7 and 9) reach significance.

Considering the three studies together, it seems clear that:

1. The kind of "direct-instruction" strategies suggested by research findings to be related to higher achievement in the elementary school, can be translated into lists of teacher strategies (or principles or behaviors).
2. This (or these) model(s) combine classroom management and instructional management skills in a single "efficiency" model of instruction designed to increase academically engaged time in the classroom.

3. These strategies can be effectively taught to teachers in inservice settings. All three studies demonstrated this, but the results from Project QUEST are particularly convincing.
4. The strategies themselves correlate well with achievement (Project QUEST) and their implementation can significantly increase achievement (Texas, Stanford).
5. Teacher characteristics, such as verbal ability and degree of structure, may be antecedants (predictors) of their learning and implementation of such management strategies (Stanford).
6. Student characteristics, such as prior achievement, may be antecedants to present achievement and also to attentiveness and task engagement (Stanford).

As we have seen, some researchers feel that classroom management (or behavior management) and the management of instruction, are so inter-related that they should be considered as a whole (Evertson, personal communication). Others feel, on the other hand, that the two are quite separate and indeed demonstrably so (Soar & Soar 1979). Whilst the efficiency model does have a satisfying coherence, the implication that good classroom management necessarily implies direct instruction is much less satisfactory. If we consider Kounin's categories of "withitness", "overlapping", "smoothness" and "momentum", they appear to be "instruction free". So, too, if we take the purely managerial categories from each of the experimental models, we can see how they relate to Kounin's categories and also, we can imagine how they might be freed from specific instructional styles. We can imagine that a teacher could be indirect or pupil-centered, yet still have a high degree of "withitness". For example, if we take the managerial strategies from the Project QUEST list and group them according to Kounin's categories we could have the following corresponding arrangements:

QUEST STRATEGIES	KOUNIN'S CATEGORIES
2, 3, 4, 16, 17	Withitness Overlapping
5, 6, 7, 8(?), 9, 10(?), 18, 19	Smoothness Momentum

We do not yet know what effect these behaviors or strategies alone, would have upon the behavior of teachers or upon the achievement of pupils. As we should expect by now, such effects are likely to be complex. Willower et al (1978), using an environmental measure they called "robustness," found, to their surprise, that "custodial" (traditional?) teachers were perceived as having "non-robust" (or dull) classes, whereas more "humanistic" teachers scored highly on "robustness" (interesting, exciting). They also found interactions among teachers in terms of sex, control ideology, degree of robustness and grade levels.

Some of the Texas research team became convinced that classroom management behaviors were indeed the critical factors in effective teaching. (Evertson, pers. communication). Not surprisingly then, the latest study from the University Research and Development Center focusses on management; management of behavior first and its combination with management of work. The study had as its aim the diagnosis of managerial behaviors which manifest themselves in the first weeks of class and which distinguish between effective and less effective teachers. Intense observations were carried out in the first weeks of class, with further observations during the school year and student on-task behavior and achievement were measured.

From observations and measures obtained during the school year (ie. not using the first weeks of school), two groups of teachers were defined: an effective group of managers and a less effective group of managers. To begin with, all classes had been carefully tested so that they were "equal". However, by the end of the year, classes from the effective group of managers showed higher average rates for student engagement, lower off-task student behavior, higher management ratings and higher average residual reading achievement, than the less effective managers' classes. The intensive data that had been collected from the classes during the first weeks of school, which included narratives, ratings and observations, was examined to see if differences between the effective and less effective managers already was apparent in those first days. Striking differences were indeed found indicating that, as has long been suspected, the first weeks of school are good indicators for the rest of the year. Effective teachers were clearly more successful in organizing and managing the behavior of their students in the first weeks and gave priority to classroom management. "Many of the instructional problems faced by the less effective teachers grew out of their difficulties in overall organization" (Emmer, Evertson and Anderson 1979a:15). Emmer, Evertson and Anderson (1979b), summarize their narrative findings by noting that,

> the more effective managers clearly established themselves as the classroom leaders. They worked on rules and procedures until the children learned them. The teaching of content was important for these teachers, but they stressed, initially, socialization into the classroom system. By the end of the first three weeks, these classes were ready for the rest of the year.
>
> In contrast to the more effective managers, the poorer managers did not have well worked-out procedures. This was most evident in the behavior of the beginning teachers. For example, one new teacher had no procedures for using the bathroom, pencil sharpener, or the water fountain; the children seemed to come and go as they pleased. Consequently, children wandered about, enormously complicating the teacher's organizational tasks (p. 12).

Although the specific categories of behavior management defined by Kounin were not used in this study, examples that would fit them abound. For example, in discussing disruptions;

> The major distinguishing characteristic of the more effective managers was that they monitored students carefully and when disruptive behavior occurred, they stopped it promptly (p. 12).

This is an example of "withitness".

Not only did the Emmer _et al_ study find that effective classroom management went with effective instructional management (and higher student work engagement and achievement), but they also found that it was accompanied by a higher rating on a classroom environment measure they called "student concerns". They note, "The more effective managers seemed to have a sense of how children perceive the classroom" (1979a:17). And, conversely, these teachers (less effective managers) didn't seem as tuned in to the needs of their children (1979a:18). Surely, this latter could be interpreted as an example of a lack of "withitness".

Summary

The preceding review of major studies dealing with the relationship of classroom management to achievement allows the following summary statements:

1. Process-Product research, seeking to develop generic traits or behaviors of effective teaching, has produced some convincing evidence linking classroom management and instructional management. A "direct instruction" model of teaching in elementary grades stresses efficient use of learning time (time-on-task) in order to improve achievement (Rosenshine's model).

2. These research findings have been translated into lists of skills or principles or strategies which teachers can be taught and can use successfully (The Texas, Stanford and Alberta studies).

3. These same studies have shown that teacher inservice training in the use of these skills can be effective, and that such training can produce a more efficient use of learning time (time-on-task) with subsequent improvement in achievement.

4. At present, the results of these studies apply only to arithmetic and language arts in lower elementary grades.

5. Research into teacher and student characteristics and into probing the classroom as a dynamic social system, has resulted in findings that indicate more complex interactions than are predicted from generic research. While some of the results may appear to contradict the generic findings, many modify or complement them. The conclusions from these studies are significant enough to warrant their inclusion or consideration in future research designs and should act as a brake on the temptation to accept such simple models as that of "direct-instruction" as panaceas for universal application.

Future Research

The studies reviewed here further indicate two broad categories in which to consider future research: (1) Practical or applied research designs of the kind used in the Texas, Stanford and Alberta studies. That is, the use of quasi-experimental designs which attempt to effect changes in real classrooms and so offer findings of immediate classroom application. (2) "Pure" research, designed to explore the complex relationships of all the variables that make up the classroom system and that interact at many levels with management skills.

It is the first type of research which has been the focus of this literature review and to which the following recommendations are directed. They are offered with the view that a most pressing need is to replicate, clarify and extend the results so far obtained. Thus, future studies might attempt to demonstrate the following:

1. That research findings can be translated into effective classroom practice; that the use of teacher strategies (principles) or behavior management variables derived from research findings are related to higher achievement in elementary grades because of improved use of learning time. This has been quite well demonstrated by Project QUEST (MacKay, 1979). Future studies could provide more of this kind of verification.

2. That sets of such principles can be successfully taught to teachers through inservice training sessions and these can be implemented successfully in the classroom. All three studies have shown this to be so, with Project QUEST giving the most convincing results.

3. That more efficient use of student learning time or time-on-task results in increased achievement. The Texas and Stanford studies have shown some increased achievement but this needs to be confirmed and replicated at other grade levels.

4. That managerial efficiency and/or cognitive gains are not achieved at the expense of other important objectives of schooling, such as emotional and social development. Measures of classroom climate or student affect can be used to "monitor" or compare the effects of managerial style on such variables. (See for example the findings on student concerns reported on page 34).

Such future research studies might contain the following design features:

1. A set (or sets) of strategies or principles of classroom and instructional management suitable for the inservice training of teachers.

2. Procedures for inservice training of teachers.

3. Use of equalized classrooms (randomly assigned to treatment and control groups) which should include grade levels other than lower elementary.

4. A long enough experimental period to allow observational data to be gathered systematically.

5. Criterion measures (cognitive and affective) that are appropriate to the content covered and that are discriminating enough to detect experimental effects.

Also, these future studies might give more care and attention to the following:

1. Close cooperation between researchers and teachers in the development of strategies to be taught and in teacher inservice training. The former is recommended by the Texas and Stanford studies and was used to good effect in Project QUEST (Alberta).

2. The use of two (or more) inservice training packages, possibly along the "minimal" and "maximal" lines of the Stanford study. Two of the studies used more than one training style and obtained differing implementation rates. Project QUEST'S implementation rates were the highest, indicating, perhaps, that cooperation between research team and teachers is a more significant factor than the type of inservice training provided.

3. Measures of teacher characteristics, such as verbal behavior, should be added to research designs. The Stanford study showed that teachers' verbal ability was a significant predictor of implementation and might be a more important factor than style of inservice training.

4. Student characteristics, concerns and perceptions of the classroom environment have been shown to be relevant to many of the goals of education. Those characteristics most pertinent to the group being studied should be considered in the research design.

5. Future studies should be carried out using other grade levels and subjects, since the data upon which present models are based were collected from English and arithmetic classes in lower elementary grades. There is evidence of subject matter and grade level interactions with many of the variables used to generate the strategies in previous studies (eg. see Fedigan 1979). In order to be able to draw any generalizations from the findings, it would be desirable to replicate studies at the upper elementary, junior high school and even senior high school levels and include subjects other than elementary language and mathematics.

Another line of practical research is suggested by the more recent University of Texas study which diagnosed those managerial behaviors manifesting themselves in the first weeks of school and which appear to distinguish between teachers classified as effective or ineffective after year long systematic observation. A close examination of the Texas data, when they become available, might suggest a set of effective managerial principles or strategies which teachers (especially new teachers) should implement at the beginning of the school year. Since effective and ineffective managers were clearly differentiated, and since these differences persisted and did have an effect on pupil achievement, inservice training treatments similar to those used in the studies just described are suggested. For beginning teachers a pre-service training could be studied. The research design for such projects could be very similar to the ones already described.

Studies of the kind suggested above have several advantages: they further our research knowledge, they involve practicing teachers in developing skills that can be of immediate help to them in classroom management and it is hoped that they will help in creating a better climate for learning in our schools.

APPENDIX

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Appendix

Suggested variables and their measurement, for classroom management studies of the type recommended in this review.

I. INDEPENDENT VARIABLES (TREATMENTS)

A. In-service teacher training (classroom and instructional management skills)

The following three sets of "principles" represent research findings translated into teacher behaviors or strategies designed to increase the efficiency of classroom learning.

(i) Treatment variables used in the Texas study.

I. ORGANIZATION AND MANAGEMENT

GETTING THE CHILDREN'S ATTENTION

1. The teacher gets everyone's attention before starting the lesson.
2. The children sit with their backs to the rest of the class while the teacher faces the class.

INTRODUCING THE LESSON

3. The teacher introduces the lesson with a brief overview.
4. The teacher presents new words clearly.
5. After presenting new words, the teacher has the children repeat them.
6. A demonstration or explanation precedes the children's attempts to do the work.

CALLING ON CHILDREN

7. The teacher should work with one child at a time, so that everyone is checked and receives feedback.
8. The teacher should call on children in order rather than randomly.

9. Occasionally the teacher should question a child about another child's responses (to keep everyone alert).

10. The teacher should minimize calling on volunteers.

11. The teacher should discourage call outs and should emphasize that each child is responsible for the question asked of him.

12. The teacher should avoid rhetorical questions, answering her own questions, or repeating questions. These confuse the children.

MEETING INDIVIDUAL LEARNING NEEDS WITHIN THE GROUP

13. At some point, the teacher must decide if the whole group can meet the lesson's objectives. If she decides they can, she should hold the group together, making sure that everyone masters each step before moving on to the next step.

14. If the teacher decides that everyone cannot meet the objective, the students who can do so should be taught through to the end and then dismissed, so that the teacher can spend more time with the other children.

15. An exception to the above occurs when the teacher wants to use a student who has mastered the objective as a model for the others. Here, she may retain one or more such students in the group in order to carry on a dialogue.

16. If some of the children do not succeed in meeting the objectives before lesson time is up, arrangements should be made for extra tutorial help.

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II. RESPONDING TO CHILDREN'S ANSWERS

The teacher's feedback to children's answers depends on (1) the type of question (whether it requires memory or reasoning), (2) the pace of questioning (whether rapid for drill or slower for more thoughtful questions), and (3) the child's answer (correct, incorrect, "I don't know," or no response).

WHEN THE CHILD DOES NOT RESPOND

17. After asking a question, the teacher waits for the child to respond and also sees that other children wait and do not call out answers. During the more slowly paced parts of the lesson, the teacher should wait for an answer as long as she feels that the child is thinking and will answer, but not so long as to embarrass the child or lose the other children's

attention.

If the child does not respond within a reasonable time, the teacher should indicate that some response is expected by probing ("Do you know?"). She should then simplify (see #19) according to the type of question.

WHEN THE CHILD'S ANSWER IS INCORRECT

18. The teacher should indicate that the answer is wrong, and then follow simplification procedures outlined below for the two types of questions.

SIMLPIFICATION PROCEDURES

19. The appropriate simplification procedure is determined by the type of question.

    a. If the question deals with factual knowledge that cannot be reasoned out, the teacher should give the answer to the child and then move on.

    b. If the question is one that the child could reason out with help, the teacher should provide clues or simplify the question. If the clues still do not help the child, he should be given the answer. The teacher should never ask another child to supply the answer.

WHEN THE CHILD IS CORRECT

20. The teacher should acknowledge the correctness, and make sure that everyone else heard and understood the answer.

PRAISE AND CRITICISM

21. Praise is important but should not be used indiscriminately. Praise thinking and effort more than just getting the answer, and make praise as specific and individual as possible.

22. Criticism should also be as specific as possible and should include specification of desirable or correct alternatives.

(Anderson & Brophy 1976:3-6).

(ii) Treatment variables used in the Stanford study.

Behavior Management and Classroom Discipline

1. Teachers should have a system of rules that allows pupils to

attend to their personal and procedural needs without having to check with the teacher.

2. Teachers should prevent misbehaviors from continuing long enough to increase in severity or spread to and affect other children.

3. Teachers should attempt to direct disciplinary action accurately -- that is, at the child who is the primary cause of a disruption.

4. Teachers should keep 'overreactions' to a minimum, (even though over-reactions are probably effective in stopping the misbehavior).

5. Teachers (and aides, if present) should move around the room a lot, monitor pupils' seatwork, and communicate to the pupils an awareness of their behavior, while also attending to their academic needs.

Instructional Methods

6. When pupils work independently, teachers should insure that the assignments are interesting and worthwhile and still easy enough to be completed by each third-grader working without teacher direction.

7. Teachers should keep to a minimum such activities as giving directions and organizing the class for instructions. They can do this by writing the daily schedule on the board, insuring that pupils know where to go and what to do, etc.

8. Teachers should spend at least one-third to one-half of their time teaching larger groups of pupils (more than eight children). When they do teach smaller groups or individuals, they should take steps to make sure that the other pupils in the class have work to which they can attend.

9. Teachers should make abundant use of textbooks, workbooks, and other pencil-and-paper activities. These have been found to be associated with higher pupil achievement. But the use of games, toys, and machines has not been found to be associated with higher pupil achievement.

10. Teachers should frequently conduct public (i.e., addressed to a larger group or the whole class) question-and-answer sessions concerned with the academic subject matter at hand. With less academically oriented pupils, teachers may find it helpful to initiate some brief private discussions concerning personal matters.

11. Teachers should provide visual demonstrations and phonics exercises in conjunction with reading activities.

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Specific Methods for Asking Questions and Providing Feedback

12. In selecting pupils to respond to questions, teachers should use the technique of calling on a child by name before asking the question, as a means of insuring that all pupils are given an equal number of opportunities to answer questions.

13. Teachers should avoid calling on volunteers more than 10 or 15 percent of the time during question-and-answer sessions. It is also advisable to discourage pupil "call outs" to questions asked of other children (except possibly from less academically oriented children who may benefit from this type of activity).

14. In the interest of promoting smooth, task-oriented discussions, teachers should not encourage large numbers of pupil-initiated questions and comments. It is also important for teachers to listen carefully to pupils' opinions and, if a disagreement is called for to express such disagreement to the child.

15. With less academically oriented pupils, teachers should ask easier questions -- questions that can almost always be answered correctly. When questioning more academically oriented pupils, teachers should ask more difficult questions -- questions that are answered incorrectly about one fourth of the time.

16. Teachers should give praise only for really outstanding work; also, praise is likely to be more effective in communicating higher expectations ("you can do better") to more academically oriented pupils.

17. With less academically oriented pupils, teachers should always aim at getting the child to give some kind of response to a question. Rephrasing, giving clues, or asking a new question can be useful techniques for bringing forth some answer from a previously silent pupil or one who says "I don't know" or answers incorrectly.

18. With more academically oriented pupils who generally become actively involved in discussions, teachers should concentrate on getting the correct response. Therefore they should redirect questions to other pupils if the more academically oriented pupil answers incorrectly.

19. Teachers should give the answer (to both more and less academically oriented pupils) if the response is at least partly correct. Teachers should not simply repeat the same question if any pupil (either more or less academically oriented) answers incorrectly, says "I don't know," or remains silent.

20. With more academically oriented pupils, teachers should give

brief feedback extensively (80% or more of the time) during private, one-to-one discussions. When dealing with less academically oriented pupils, teachers should use approximately equal amounts of brief and longer feedback, tailoring the duration of their reactions to the needs of the individual child in each situation.

21. During reading-group instruction, teachers should give a maximal amount of brief feedback, and provide fast-paced activities of the "drill" type.

22. During public question-and-answer sessions, teachers should occasionally give a detailed, "why" explanation in answer to a question.

(Crawford and Stallings 1978:2-6)

(iii) Treatment variables used in Project QUEST (Alberta).

1. Teachers should use a system of rules dealing with personal and procedural matters.
2. Teachers should prevent misbehaviors from continuing.
3. Teachers should direct disciplinary action accurately.
4. Teachers should move around the room a lot (monitoring seatwork).
5. Teachers should handle disruptive situations in a low key manner (non-verbal, proximity, eye contact).
6. Teachers should insure assignments are interesting and worthwhile when children work independently.
7. Teachers should use a system of rules which allows pupils to carry out learning tasks with a minimum of direction.
8. Teachers should optimize academic learning time. Pupils should be actively involved and productively engaged in learning tasks.
9. Teachers should use a standard signal to get students' attention.
10. Teachers should not begin speaking to the group until all students are paying attention.
11. Teachers should use a variety of instructional techniques

treatment in four, half-days of training, whilst a second group spent two, half-days in training using only the first three components.

C. Other Covariables

Teacher Characteristics

Since there is evidence for the belief that the implementation of inservice programs depends to a certain extent on the personal (or motivational) characteristics of the teachers concerned, the following are suggested.

(i) Verbal ability. This was found to be a powerful predictor of rate of implementation in the Stanford study. Various measures (e.g. Millers Analogies) can be used.

(ii) Degree of structure. This was also found to be a predictor in the Stanford study, but to a lesser extent. Again a wide range of measures could be used, including the Stanford measure.

Degree of structure probably is related to other concepts such as conceptual level and dogmatism which also could be used as covariables.

(iii) Grade level and/or subject taught. If grade levels other than lower elementary are being studied these could become important variables. Grade level and subject matter effects have been reported for the few studies carried out at upper elementary (Grade 6) and at junior high (see p.31).

II. DEPENDANT VARIABLES (OUTCOME MEASURES)

A. Direct Measures of the Treatment

(i) Implementaton rates. These are measures of the success of the experimental treatment, that is, the inservice training. Since some or all of the treatment variables already would be being used by some or all of the teachers, their rates of occurrence in the non-treatment (control) classrooms should be used as base-line or "normal" rates against which the treatment is measured. Implementation rates are best measured from direct classroom observation by observers whose reliability has been established.

(ii) Student on-task behavior. The inservice "principles" or "strategies" are designed to increase students' engagement with academic work or work related tasks, so a measure of attention or time-on-task is needed. Again, direct classroom observation is required and again rates of work engagement in control classes can give a base-line to which the experimental classes can be compared.

B. Indirect Measures of the Treatment

(i) Student achievement (total treatment). If the proposed relationship of effective classroom mangement resulting in greater work involvement in turn resulting in higher achievement, is to be tested, then appropriate measures of student achievement are required. To be appropriate the criteria of student achievement must be (a) closely related to the content covered in

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the classroom (b) sufficiently discriminating to detect treatment effects. The requirement of comparability (generalizability) calls for standardized tests of some kind, but as we have seen with Project QUEST (p.32), care must be taken to find suitable ones. Here in Alberta the M.A.C.O.S.A. tests of achievement (reading, written expression, mathematics, science) suggest themselves as satisfying both criteria.

(ii) Student achievement (each of the treatment variables). In order to find out which of the strategies or principles of classroom management have the most powerful and consistent effects (implementation + work involvement + achievement), they must be tested separately against the outcome measures, especially those of achievement.

C. Covariables

Student characteristics. Studies of classroom ecology have suggested that students themselves may determine the amount and type of classroom management and that individual students cope differentially with the management structure of the classroom. Among the student characteristics that have been implicated are the following:

(i) S.E.S. (socio-economic-status). This has shown great predictive power in some U.S. studies, but less power in studies in Alberta (e.g. Fasano 1980).

(ii) Sex. There is evidence to suggest that teachers "manage" boys differently than "girls" especially in elementary grades.

(iii) Ability. There is some evidence that high ability students react differently to classroom management structures than do low ability students.

(iv) Attitude to subject. The common opinion that business-like, directive teachers run joyless classrooms that engender poor attitudes to school and unhealthy personal and group social development needs to be taken into account. Especially in the elementary grades a student's attitude towards a subject matter may be as important to his/her future work on that subject as any particular achievement score. To test whether effective classroom management (greater teacher control and structuring) has a positive or negative effect upon attitude a battery such as the School Subjects Attitude Scales (Nyberg and Clarke, 1978) is suggested.

(v) Classroom climate. Similarly to test further dimensions of the classroom climate as it is perceived by the students both cognitively and affectively a scale such as the Learning Environments Inventory (Walberg 1971) is recommended.

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